DRAFT
Data Assessment for Water Bodies in the Ouachita River Basin listed for Dioxin on the Louisiana Department of Environmental Quality's 1999 CWA Section 303(d) List

Prepared for:

U.S. Environmental Protection Agency Region 6

in collaboration with the

Louisiana Department of Environmental Quality and

Louisiana Department of Health and Hospitals

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SECTION 1
INTRODUCTION

Section 303(d) of the Federal Clean Water Act requires states to identify water bodies that are not meeting state water quality standards and to develop total maximum daily pollutant loads for those water bodies. A total maximum daily load (TMDL) is the amount of a pollutant that a water body can assimilate without exceeding the established water quality standard for that pollutant. Through a TMDL, pollutant loads can be distributed or allocated to point sources and nonpoint sources discharging to the water body. While states agree that TMDLs are valuable tools necessary to restore and maintain water quality in impaired watersheds, states and EPA also recognize that some water bodies on 303(d) lists were inappropriately listed as impaired based on limited available data sets or other reasons.

The Louisiana Department of Environmental Quality's (LDEQ) October 28, 1999 Court Ordered §303(d) List was based on a variety of historical data sources assessed in conjunction with the state's 1996 §305(b) Report (*Water Quality Inventory*). Specific to the Ouachita River Basin in northern Louisiana, four water bodies were identified on the 303(d) List as impaired based on concerns for high levels of dioxin in fish. These five water bodies are identified in Table 1. The data and information available to LDEQ and EPA that resulted in these water bodies being listed on the 303(d) List was collected between 1988 and 1996.

Table 1 Excerpt from LDEQ 1999 Court Ordered §303(d) List

Water Body Name	Subsegment Number	Reason for Listing
Dugdemona River	Subsegment 081401	Dioxin Concern
Ouachita River	Subsegment 080101	Dioxin Concern
Tisdale Brake/Staulkinghead Creek to	Subsegment 080912	Dioxin Concern
Little Bayou Boeuf/Wham Brake	Subsegment 080900	Fish Consumption Advisory – Dioxin in Fish Tissue
Bayou Lafourche	Subsegment 080904	Fish Consumption Advisory – Dioxin in Fish Tissue

This report summarizes and re-evaluates the historic data that was originally used to list the water bodies and incorporates more recently available data to determine if these water bodies warrant the development of a TMDL. The objective of this data assessment is to determine if there is sufficient evidence to indicate that dioxin levels are no longer a concern in fish tissue, or if elevated levels of dioxin persist, which will confirm the need for a dioxin TMDL to be prepared.

Ouachita River Basin

The Ouachita River's headwater is found in the Ouachita Mountains of west central Arkansas near the Oklahoma border. The Ouachita River flows south through northeastern Louisiana and joins with the Tensas River to form the Black River, which empties into the Red River. Average annual precipitation in the basin is approximately 56 inches based on a 30-year record (LSU, 2000). The Louisiana portion of the Ouachita River Basin (Basin 8) covers approximately 10,000 square miles of drainage area. Most of the basin consists of rich, alluvial plains cultivated in cotton and soybeans. The northwest corner of the basin is forested in pine, which is commercially harvested (LDEQ, 1996). Associated with the commercial forestry activities in the basin are pulp and paper mill plants that discharge into the Ouachita River or its tributaries. Figure 1 provides a map of the Ouachita River Basin identifying each of the subsegments listed above in Table 1.

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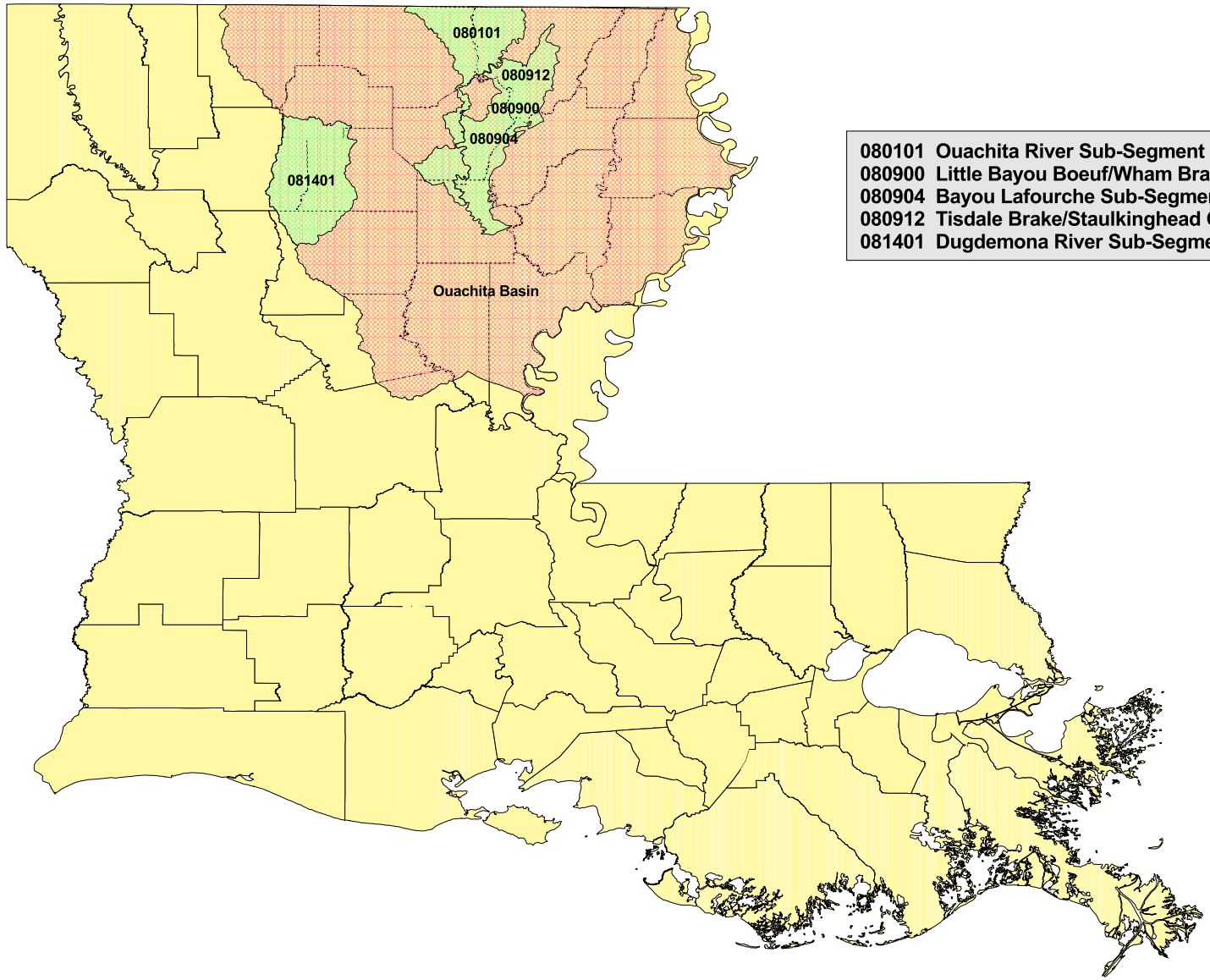

080101 Ouachita River Sub-Segment
080900 Little Bayou Boeuf/Wham Brake Sub-Segment
080904 Bayou Lafourche Sub-Segment
080912 Tisdale Brake/Staulkinghead Creek Sub-Segment
081401 Dugdemona River Sub-Segment

Study Areas (Sub-Segments)
Ouachita Basin
Louisiana Parishes

N

10 0 10 20 Miles

Figure 1

Ouachita Basin Map

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SECTION 2
BACKGROUND ON DIOXIN SCREENING LEVELS

The following is an excerpt from the 1999 U.S. EPA Fact Sheet on Dioxins:

Sources of Dioxins in the Environment

> *Dioxins are formed primarily as unintentional by-products of incomplete combustion and various chemical processes. Although forest fires and possibly other natural sources may produce dioxins, these sources are small compared with anthropogenic sources. Dioxins are produced in small quantities during the combustion of fossil fuels, wood, municipal and industrial waste. Bleaching processes which were used in pulp and paper production produced dioxins, and they occur as contaminants during the production of some chlorinated organic chemicals, such as chlorinated phenols. Currently, the major environmental source of dioxins is incineration. Dioxins have been detected in soil, surface water, sediment, plants, and animal tissue in all regions of the earth. Dioxins are highly persistent in the environment with reported half-lives in soil and sediment ranging from months to years. Because dioxins have very low solubility in water and low volatility, most are contained in soil and sediments that serve as environmental reservoirs from which dioxins may be released over a long period of time. Volatilization and particle resuspension from environmental reservoirs are probably important contributors to global distribution (EPA, 1999).*

The first step Parsons took to assess the historical and current dioxin data available for each water body was to identify an acceptable screening or action level for dioxin in edible fish tissue. Initially, four primary sources were evaluated to determine the applicable screening value for data assessment purposes:

1. LDEQ Surface Water Quality Standards, Environmental Regulatory Code Title 33 Part IX, December 2000 LDEQ Water Quality Standards
2. Louisiana Department of Health and Hospitals (LDHH), Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana, January 1997.
3. U.S. EPA Fact Sheet, Polychlorinated Dibenzo-p-dioxins and Related Compounds Update: Impact on Fish Advisories, EPA-823-F-99-015, September 1999.
4. USEPA. 2000. Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories - Volume 1, Fish Sampling and Analysis, Third Edition. U.S.

Environmental Protection Agency, Office of Water, EPA 832-B-00-007. November 2000.

While each of these sources provide fish tissue screening levels that could be used for assessment purposes, Parsons turned to LDHH for a final determination. As the state agency with the primary responsibility for issuing fish and shellfish consumption advisories and bans, LDHH issued an update on November 28, 2001, (see Appendix C) for the risk assessment of dioxin levels in fish for Wham Brake, Bayou Lafourche, and Lake Irwin. The risk assessment methodology defined in this LDHH update is the most conservative (or protective of human health) of any of the guidance sources referenced. This update provided Parsons with the necessary criteria and assumptions to define an acceptable screening level for dioxin in edible fish tissue. With this level established, data was then assessed to determine whether a TMDL should be developed for the water body, or if dioxin concentrations in fish have been reduced to levels necessary to lift a consumption advisory and therefore allow the water body to be removed from the state's 303(d) list.

For the purposes of this report, a screening level of 1.56 pg/g was selected based on the LDHH November 28, 2001 update and the methodology outlined by the LDHH protocols for issuing health advisories and bans on fish consumption. This value, summarized in Table 2, assumes a risk level of 10^{-4}, a cancer slope factor of 1.5E+05 mg/kg/day, and a consumption rate of 30 g/day, values approved by LDHH and used jointly by LDHH and Tulane School of Public Health when conducting dioxin risk assessments (Hartley, 2001). The assessment conducted in this report also follows the guidance, which states that in order to lift an advisory, the average concentration of the last two years of data must be below current health guidelines (LDHH, 1997).

Table 2 Dioxin Human Health Screening Values Derived from LDHH Guidance

	RL	CSF	BW	CR	Fish tissue SV (mg/kg)	(pg/g)
LDHH	0.0001[1,2]	150000[1,2,3]	70[1,2]	0.03[3]	1.56E-06	1.56
EPA	1.00E-04	1.56E+05	70	0.0175	2.56E-06	2.56

SV=Screening Value; [(RL/CSF)*BW]/CR
RL = Risk Level; e.g., 10-6, 10-5, 10-4
CSF = Dioxin cancer slope factor; EPA value 1.56E+05 [1/(mg/kg-d)], LDHH value 1.5E+05 [1/(mg/kg-d)])
BW = Body weight; Assumed to be 70 kg
CR = Mean daily consumption rate (kg/d)
LDHH = Louisiana Department of Human Health
EPA = Environmental Protection Agency

Sources:

[1] LDHH, 1997. Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana. Louisiana Department of Health and Hospitals, Office of Public Health. January 1997.

[2] LDHH, 2001. Louisiana Department of Health and Hospitals (LDHH). November 28, 2001. Fish Consumption Advisory for Wham Brake, Bayou Lafourche, and Lake Irwin Louisiana Department of Environmental Quality.

[3] Hartley, W. 2001. Memo from Dr William Hartley reviewing joint LDHH and Tulane SPH&TM dioxin risk assessment in fish from Wham Brake, Bayou Lafourche, and Lake Irwin.

SECTION 3
DATA ASSESSMENT SUMMARIES FOR LISTED WATER BODIES

Dugdemona River (Subsegment 081401)
Background

The Dugdemona River watershed is located in north central Louisiana and includes portions of Lincoln Parish, Bienville Parish, Jackson Parish, Winn Parish and Natchitoches Parish. While the entire subsegment 081401 is listed on the 303(d) list for a variety of pollutants, the dioxin concern is associated with the portion of the mainstem of the Dugdemona River downstream from the town of Hodge, Louisiana (see Figure 2). The dioxin concern evolved from the fact that the Dugdemona River at Hodge, LA was included as part of the National Study of Chemical Residues in Fish (EPA 1992), formerly referred to as the National Bioaccumulation Study. This portion of the river was selected in response to the location of the Smurfit-Stone Container Corporation (formerly the Stone Container Corporation), which discharges effluent under NPDES permit number LA0007684. The Smurfit-Stone facility has always operated as a brown krafting plant that does not use a chlorine bleaching process that would create dioxin by-products and therefore the permit never contained a dioxin effluent limit (McDonald, *personal communication* 2001). No data is available in this watershed to determine if or to what extent nonpoint source loadings of dioxin are occurring. These facts are the primary foundation of the assessment approach used to determine if a TMDL for dioxin is necessary for the Dugdemona River.

Data Sources and Analysis

The Dugdemona River at Hodge, LA was included as part of the National Study of Chemical Residues in Fish (EPA, 1992) under episode number 3092. Carp and warmouth samples were collected and analyzed as representative of bottom-feeders and predatory game fish respectively. The samples, collected between 1986 and 1987, were composite samples of 3 to 5 adult fish of similar size (EPA, 1992).

The warmouth was a fillet sample and had a Toxicity Equivalency Concentration (TEC) of 0.01 pg/g (EPA, 1992) which is well below the screening levels used for fish consumption advisories. The only dioxin congener detected in the warmouth was 1,2,3,4,6,7,8 HPCDD. The carp, however, was a whole body sample and had a TEC of 9.71 pg/g with almost all of the dioxin congeners analyzed for being detected (EPA, 1992). Furthermore, the concentration of 1,2,3,4,7,8 HxCDD in the carp was the maximum concentration measured in all water bodies in the study (see Table 3.3 of EPA 1992).

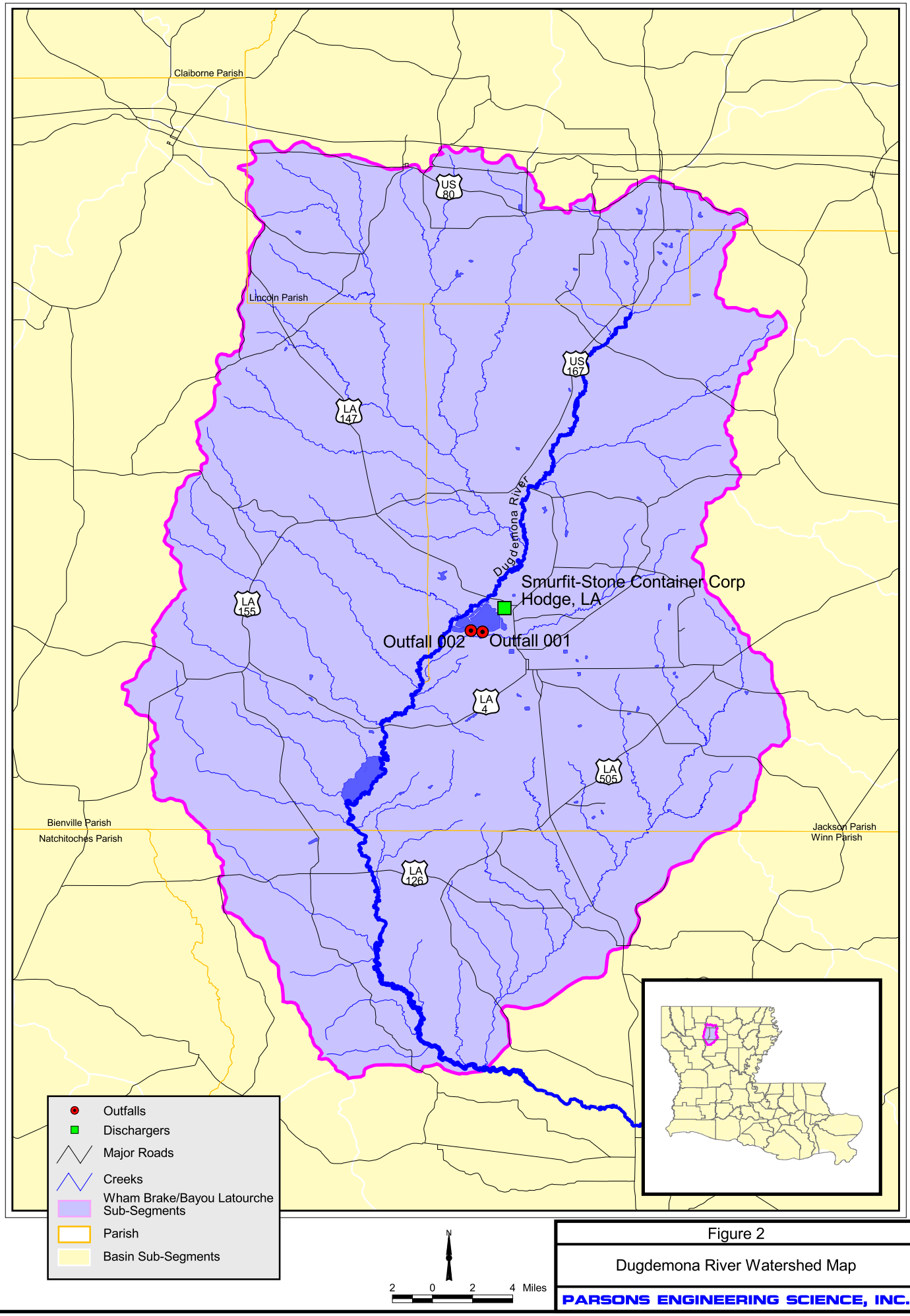

Figure 2

Dugdemona River Watershed Map

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The carp sample is not comparable to a human health based screening level since it is a whole body sample that contains non-edible tissues. These non-edible tissues, such as the liver, are lipid rich and therefore preferentially accumulate dioxins (API, 1990; TWC, 1991) and other contaminants. The following excerpt from EPA's *Assessing Human Health Risks from Chemically Contaminated Fish and Shellfish: A Guidance Manual* acknowledges that whole body samples should not be used for human health risk assessments:

> *The kind and location of tissue analyzed may influence the realism of the exposure assessment. For example, most humans consume only fillets of fish, not internal organs or whole fish. Because internal organs are often more contaminated by toxic chemicals than are fillets, exposure estimates based on chemical analyses of organs or whole fish could be unrealistically high. Removal of skin and subcutaneous fat from samples before chemical analysis generally reduces the mean concentrations of chlorinated organic compounds (EPA, 1989).*

Edible fillets, such as those analyzed for the warmouth, have much lower lipid contents and subsequently lower dioxin levels than the whole fish. Since the human health based screening level assumes a fish consumption rate, it should only be compared to edible fish tissue concentrations, which is in accordance with the LDHH risk assessment protocol (LDHH, 1997).

The Dugdemona River was not included for analysis in a companion EPA Region 6 report describing dioxin and furan concentrations in fish at selected sites in Arkansas, Louisiana, and Texas (Crocker and Young, 1990). The Crocker and Young (1990) report identified 13 sites sampled in the National Study of Chemical Residues in Fish where edible fish tissue concentrations of 2,3,7,8 TCDD were detected. The Dugdemona River was not listed as one of the 13 sites because the only edible fish tissue concentration measured, that of the warmouth, was virtually free of all dioxin congeners. The Dugdemona River was therefore not considered for further analysis or risk estimation.

Conclusions/Recommendations

The Smurfit-Stone Container Corporation mill in Hodge, LA does not utilize a chlorine bleaching process, consequently it should not be considered as a source of dioxin. According to the plant they have never had the need to sample for dioxin in their effluent (personal communication with Olevia McDonald, November 2001). This fact is reflected in the omission of a dioxin effluent limit in their NPDES permit. In addition, since there is no data available for nonpoint sources of dioxin, little can be ascertained about current concentrations or availability of dioxin in the water body. There are no known sources of dioxin in the watershed.

The only edible fish tissue sample taken from the Dugdemona River was virtually free of dioxins and had a TEC well below all established screening criteria. With such limited data available (both spatial and temporal), the original basis for placing Dugdemona River on the 303(d) list is questionable. However, with no recent fish tissue data or effluent data, it is also

impossible to accurately depict whether dioxin levels in fish are currently a legitimate problem in the Dugdemona River. However, the whole body carp sample taken as part of the National Bioaccumulation Study (EPA, 1992), while not directly comparable to a human health based criteria, did indicate that the bioaccumulation of dioxins had occurred. It is therefore recommended that no TMDL for dioxin be prepared for the Dugdemona River (Subsegment 081401) at this time. Instead EPA should fund additional fish collection and tissue analysis in 2002 to first determine if dioxin concentration levels are of significant concern to warrant the need for a TMDL. If the results of new fish tissue analysis show acceptable levels of dioxin, the water body should be removed from the list. It is therefore recommended that further edible fish tissue samples be collected from the Dugdemona River (Subsegment 081401) in order to ascertain whether the fish consumption use is impaired due to dioxin.

Ouachita River (Subsegment 080101)

Background

The Ouachita River's headwaters are located in the Ouachita Mountains of west central Arkansas. The Ouachita River flows through Arkansas before crossing into northeastern Louisiana where it eventually joins the Tensas River to form the Black River. Louisiana Subsegment 080101 of the Ouachita River originates at the Louisiana/Arkansas state line and receives upstream discharges from the Georgia Pacific pulp and paper mill in Crossett, Arkansas (see Figure 3). Georgia Pacific's mill in Crossett discharges effluent under NPDES permit number AR0001210 to Coffee Creek below Mossy Lake, a tributary of the Ouachita River. While the Georgia Pacific mill is still operating under an administratively continued NPDES permit issued in 1991. However, since 1986 the plant has phased in a number of best available technology (BAT) controls that have resulted in an incremental reduction of dioxin concentration in its effluent.

Data Sources and Analysis

The Ouachita River at Sterlington and Monroe, LA was included as part of the National Study of Chemical Residues in Fish (EPA, 1992) under episode numbers 3416 and 3080 respectively. At Sterlington composite samples were taken of channel catfish, carp, and largemouth bass; their fillets were analyzed for dioxin congener concentrations (see Appendix D-4 of EPA, 1992). The catfish TEC was 3.33 pg/g, the carp TEC was 6.78 pg/g, and the bass TEC was 0.22 pg/g. Thus, the carp and catfish TECs were above the screening level and, while no fish consumption advisory was issued, the subsegment was included on the 303(d) list.

At Monroe one composite carp sample was taken and analyzed for whole body dioxin concentration and one composite large mouth bass sample was taken and analyzed for fillet dioxin concentration. The carp had a whole-body TEC of 6.85 pg/g and the bass had a fillet TEC of 1.05 pg/g. Most of the target analytes were detected in the carp while few of them were detected in the bass. Since the carp was a whole body sample it is not comparable to a human health based screening criteria, as discussed above under the Dugdemona River. The bass sample, which consisted solely of edible tissue, had a significantly lower dioxin concentration that was below relevant screening criteria.

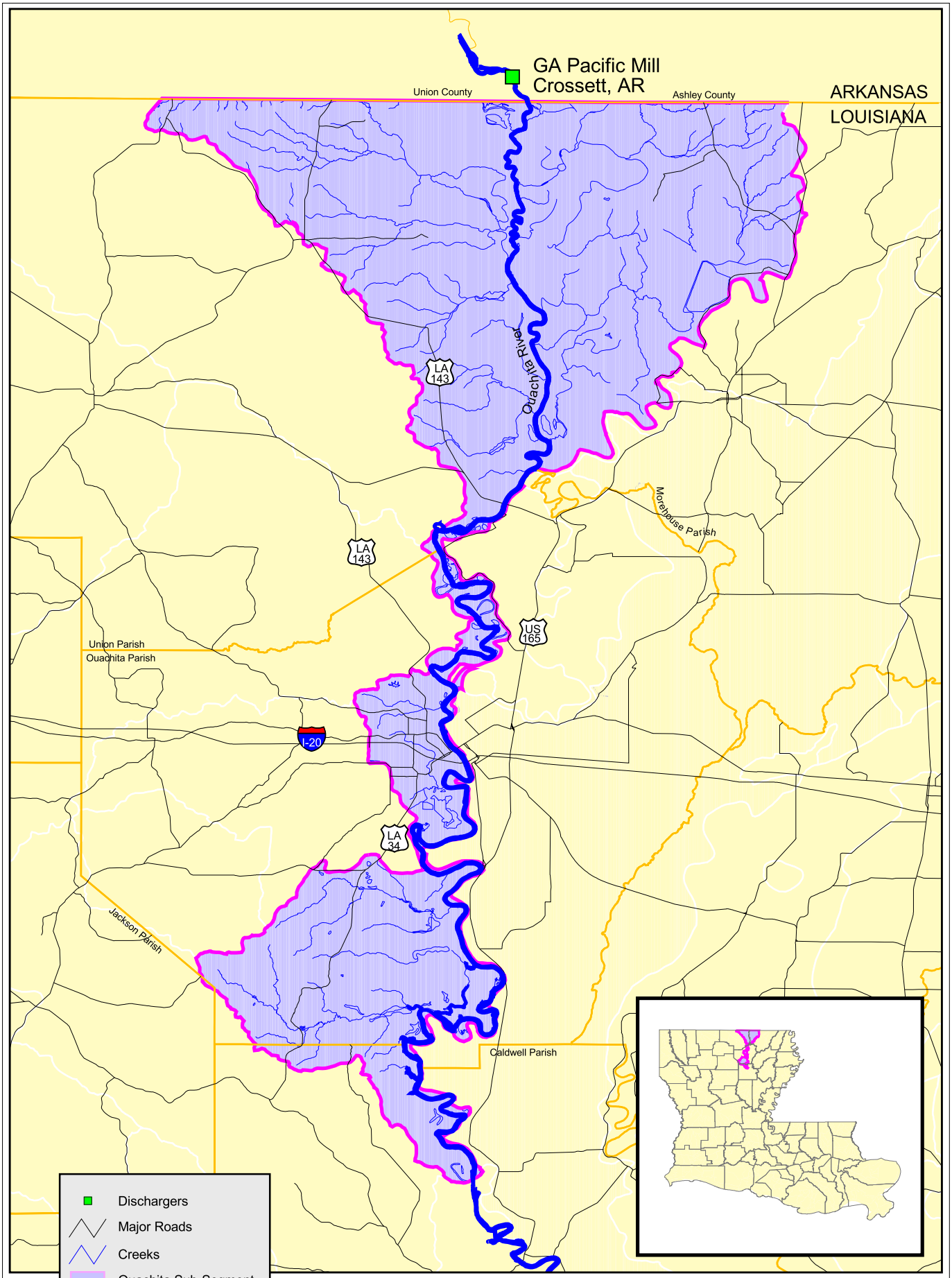

Figure 3

Ouachita River Watershed Map

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Since 1991, fish tissue samples have been collected and analyzed annually as part of Georgia Pacific's permit requirements. Georgia Pacific's fish collection efforts followed standard EPA methods and lab analysis of fish tissue was conducted by Triangle Labs. These data were obtained in electronic format from EPA Region 6 and evaluated to determine whether the Ouachita River immediately below the Arkansas state line is still impaired (the raw data are contained in Appendix B). Although the fish were all collected in Arkansas, they were considered to be representative of Subsegment 080101 because they were collected immediately upstream of Subsegment 080101 and there are no significant dischargers affecting that stretch except for the Georgia Pacific mill.

Fish tissue samples, both composite and individual, were taken upstream and downstream of the Georgia Pacific outfall. In general, sampling was conducted once a year and occasionally twice or three times per year. Multiple species were sampled, although the number and identity of species collected was not constant between sampling events. The arithmetic mean concentrations, along with the number of samples analyzed, number of sampling events, and number of species sampled per year are listed in Table 3. The annual mean concentrations are also shown graphically in Figure 4.

Figure 4 Fish Tissue Dioxin Concentrations – Ouachita River

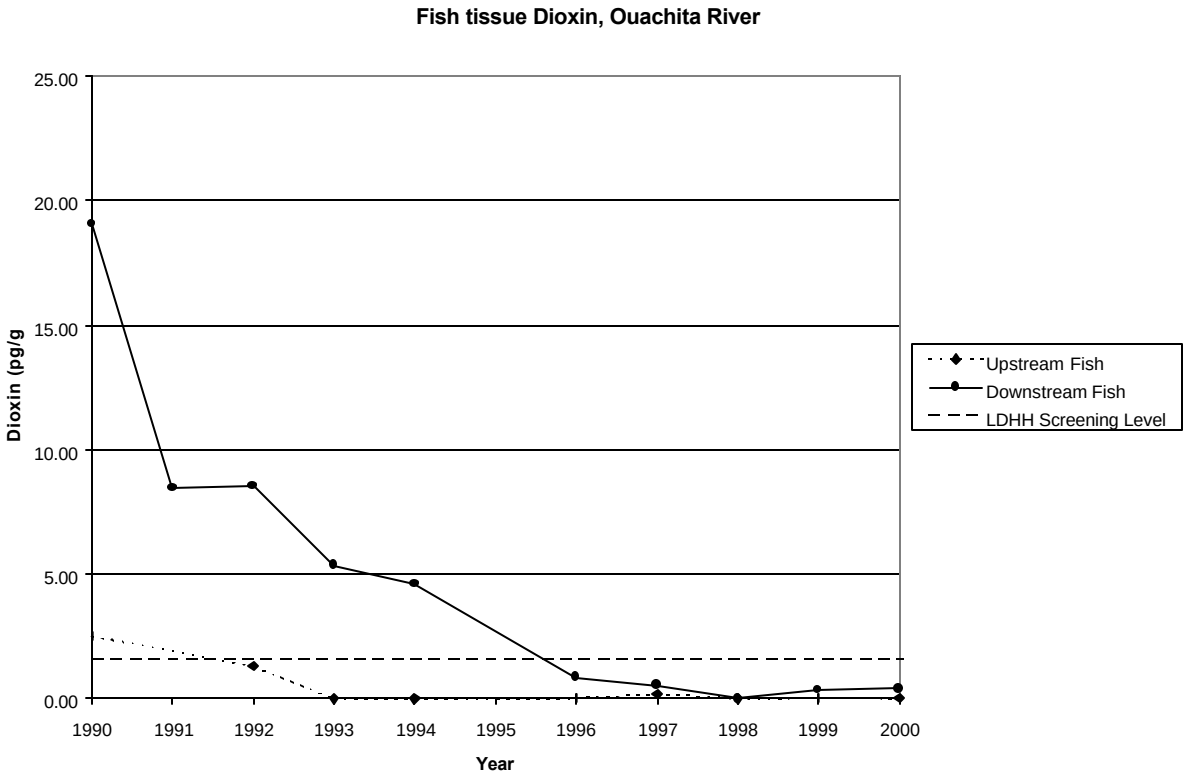


Table 3 Annual Average Dioxin Level of all Fish Species, Ouachita River

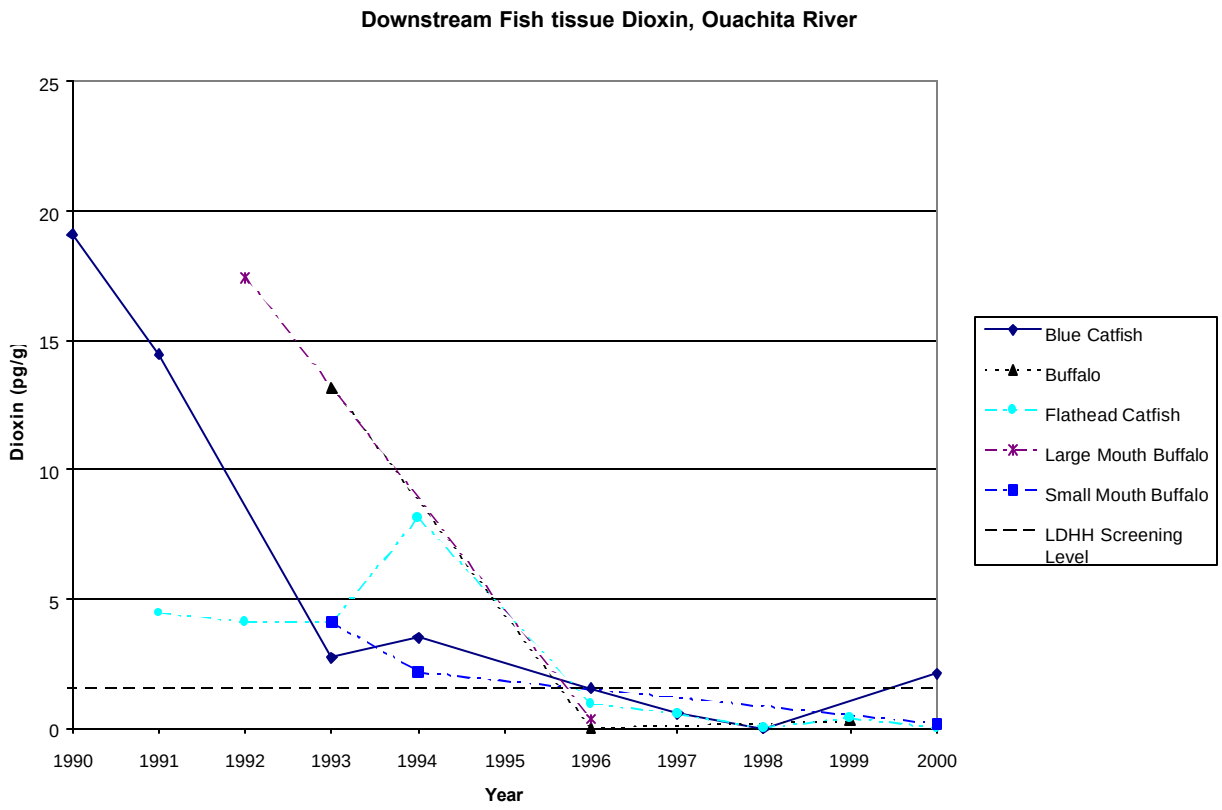
	Upstream					Downstream				
Year	Average Dioxin TEC (pg/g)	Total Number of Samples	Number of Sample Dates	Number of Species	Year	Average Dioxin TEC (pg/g)	Total Number of Samples	Number of Sample Dates	Number of Species
1990	2.52	2	2	1	1990	19.09	4	2	1
-	-	-	-	-	1991	8.45	5	2	2
1992	1.30	3	1	2	1992	8.54	3	1	2
1993	0.00	2	1	1	1993	4.65	5	3	4
1994	0.00	4	1	1	1994	4.61	10	2	3
1996	0.02	6	2	3	1996	0.86	11	1	4
1997	0.20	5	1	2	1997	0.55	4	1	2
1998	0.00	4	1	2	1998	0.00	4	1	2
1999	0.04	6	1	3	1999	0.35	5	1	2
2000	0.02	6	1	3	2000	0.41	6	1	3

As can be seen in Figure 4, the average upstream fish tissue dioxin concentrations, regardless of species, have been fairly low for the entire period of record. In late 1990 the average dioxin level was above the LDHH screening value. Subsequent samples had lower concentrations and have been essentially zero since early 1993. It is uncertain why the background concentrations were initially elevated, but that is unrelated to the Georgia Pacific mill, as the samples were collected in presumably unaffected water bodies.

The average dioxin tissue concentrations of fish collected downstream from the Georgia Pacific outfall, regardless of species, have been generally decreasing over the period of record. In 1990 average fish tissue concentrations were nearly an order of magnitude higher than the relevant screening levels, but this quickly dropped to roughly 2 to 3 times the screening levels between 1991 in 1993. The downward trend in fish tissue dioxin concentrations continued throughout the 90's, with the average values being below the LDHH screening level since 1996.

Figure 5 shows the concentration trends for different fish species downstream from the Georgia Pacific outfall. All of the different species sampled show the same basic pattern of decreasing dioxin concentration with time have generally been below the relevant screening criteria since 1996.

Figure 5 Downstream Fish Tissue Dioxin Concentrations by Species
Ouachita River



As a requirement in their permit Georgia Pacific has sampled their effluent for dioxin quarterly since 1991. Quarterly effluent dioxin concentrations from December 1991 until September 2001 for the Georgia Pacific mill were obtained from the Arkansas Department of Environmental Quality. There have been no detectable concentrations of dioxin in the effluent for this entire time period, reflecting the mill's process changes that have eliminated dioxin precursors and chlorine bleaching.

Summary/Conclusions

The Georgia Pacific mill has not been discharging detectable levels of dioxin since 1991 as a result of internal process changes. The tissue concentrations of dioxin in fish downstream from the mill's outfall have been decreasing since this process change was instituted. Furthermore, the average tissue concentrations for all fish species sampled have been below the LDHH screening level since 1996. The average tissue concentration for 1999 was 0.35 pg/g and for 2000 was 0.41 pg/g, well below the screening level of 1.56 pg/g. It is therefore recommended that no TMDL for dioxin be prepared for the Ouachita River (Subsegment 080101) and the EPA and LDEQ initiate the formal procedure to remove dioxin as a pollutant of concern in the Ouachita River from the state's 303(d) List.

Tisdale Brake/Staulkinghead Creek to Little Bayou Boeuf (Subsegment 080912)

Background

Tisdale Brake/Staulkinghead Creek (Subsegment 080912) is located west of Bastrop, LA in Morehouse Parish and is shown in Figure 6. The investigation to acquire existing data and information to discern the reason for listing these water bodies for dioxin as a concern on the 303(d) list revealed the following results.

First, no fish consumption advisory was ever issued by LDHH for Tisdale Brake/Staulkinghead Creek. Since there was never an outfall from the International Paper Mill (NPDES permit number LA0007561) discharging directly into Tisdale Brake, no fish tissue data or water quality data (point or nonpoint source) for dioxin for the Tisdale Brake reach of Subsegment 080912 are available. Recognizing these critical facts and through phone interviews with LDEQ personnel it was surmised that the basis for the original listing of dioxin as a concern in Tisdale Brake on the State's 305(b) report and subsequently the state's 303(d) list was overly conservative.

With respect to Staulkinghead Creek, the International Paper outfall #001 is in the lower reach of Staulkinghead Creek just above its confluence with Little Bayou Boeuf. Again no specific fish tissue data or water quality data for dioxin concentrations are available for Staulkinghead Creek. With no data available the original basis for placing Staulkinghead Creek on the 303(d) list is questionable. However, while the geographic location of outfall #001 would indicate that International Paper's discharge would not have an impact on the upstream reach of Staulkinghead Creek, there is no water quality or fish tissue data available to verify that dioxin levels are not a concern.

Conclusions/Recommendations

Since there is no fish consumption advisory, no fish tissue or water quality data indicating a dioxin problem and no known dioxin discharge upstream of subsegment 080912, the original basis for listing Tisdale Brake/Staulkinghead Creek for dioxin is questionable. While no data are available to ascertain the current concentrations or availability of dioxin in the water body or fish tissue, the IP discharge #001 is the very lower reach of Staulkinghead Creek, and because of its connectivity to Wham Break, this subsegment should be included in the TMDL rwritten for the lower subsegments. A conservatice approach should be taken and the relationship between this Staulkinghead Creek and the IP outfall #001 should be discussed in the TMDL for Wham Brake and Bayou Lafourche To verify that there is no need for a dioxin TMDL for Tisdale Brake/Staulkinghead Creek additional fish collection and analysis could be conducted upstream of the IP outfall #001. The feasibility of collecting a representative fish sample in Tisdale Brake/Staulkinghead Creek will need to be determined given the lack of flow and limited fish community that exists upstream of the International Paper outfall #001. This conservative approach will ensure that dioxin sources do not create the possiblity of a continuing problem in the watershed upstream of the IP discharge.

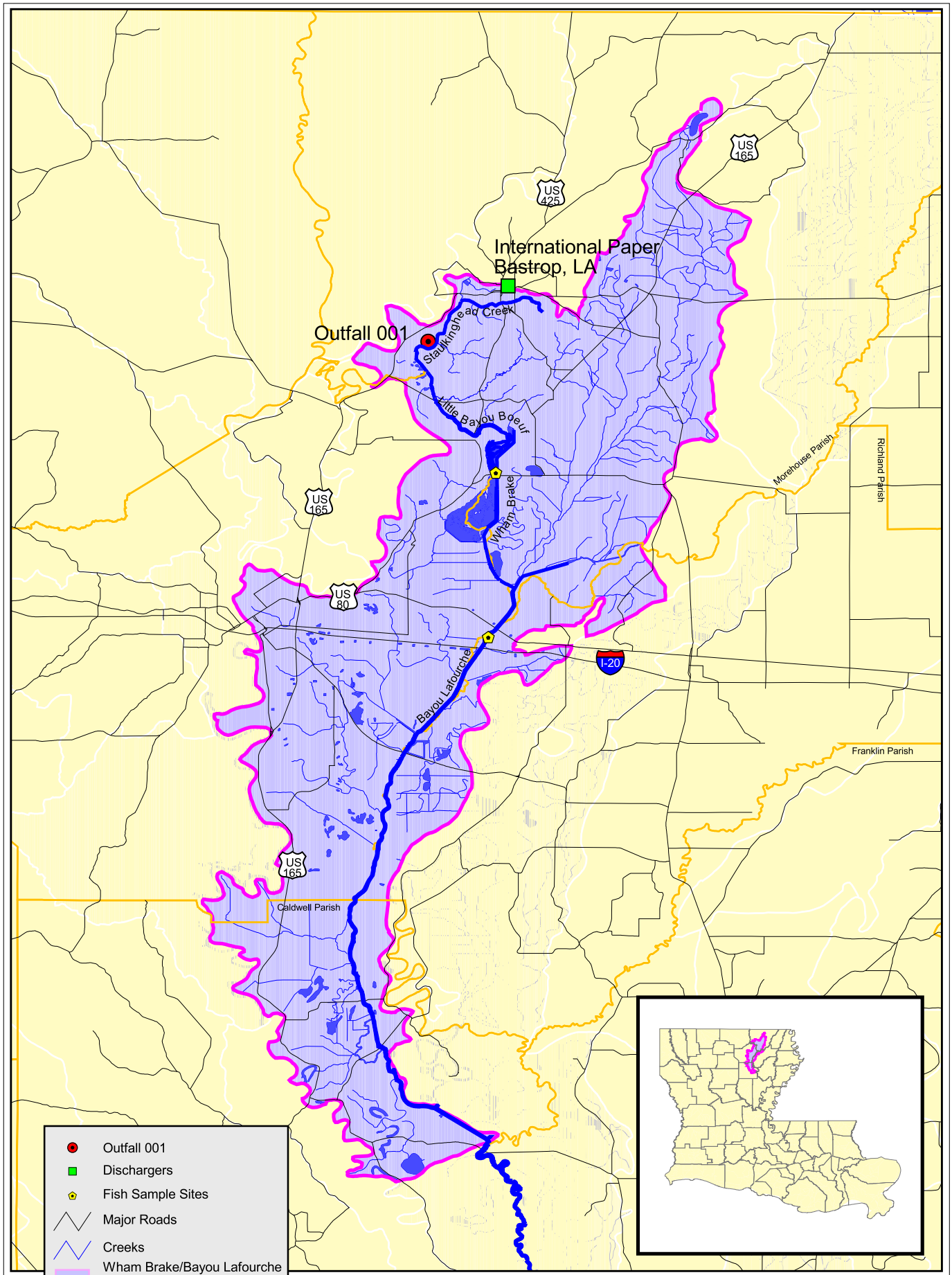


Figure 6

Wham Brake/Bayou Lafourche Watershed Map

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Little Bayou Boeuf/Wham Brake/Bayou Lafourche (Subsegments 080900 and 080904)

Background

Subsegment 080900 (Wham Brake/Little Bayou Boeuf) receives wastewater discharge from the International Paper's Louisiana Mill (NPDES permit number LA0007561). It forms the partial border of Ouachita and Morehouse parishes as it meanders towards its confluence with Bayou Lafourche (Subsegment 080904), which forms the partial border of Ouachita and Richland parishes. Production processes at IP Louisiana mill, including elemental chlorine free (ECF) bleaching technology, have been in place at least since 1998 and are in compliance with BAT standards. Nevertheless, fish consumption advisories have been in effect since 1987 for Wham Brake and 1994 for Bayou Lafourche which are downstream of the pulp and paper mill wastewater discharge outfall 001 (LDHH, 1993a, 1993b).

Data Sources and Analysis

Wham Brake and Bayou Lafourche were included in the National Study of Chemical Residues in Fish (EPA 1992). Fish samples were collected and analyzed for dioxin in Wham Brake (episodes 3087 & 3425) and Bayou Lafourche (episode 3353) during 1986 and 1987. Ten fish were sampled comprising several species (Table 4).

Table 4 Wham Brake and Bayou Lafourche Bioaccumulation Results

Wham Brake

Episode 3087				Episode 3425			
Species	Sample type		Dioxin Level	Species	Sample type		Dioxin Level
Carp	WB	pg/g	157.87	Carp	WB	pg/g	180.32
White Crappie	F		22.98	Channel Catfish	F		56.33
Bluegill	WB		75.95				
LM Bass	WB		22.17				
White Crappie	F		25.93				
Bluegill	WB		82.18				

Bayou Lafourche

Episode 3353			
Species	Sample type		Dioxin Level
Blue Catfish	BF	pg/g	6.73
Sm Buffalo	WB		8.63

WB-Whole body
F- Fillet

While the dioxin concentration levels from the 6 whole body samples are not comparable to the human health screening levels, results from all 4 fillet samples taken from both waterbodies ranged between 6.73 pg/g and 56.33 pg/g which exceed the LDHH screening level of 1.56 pg/g and the EPA (2.56 pg/g) screening criteria. These data ultimately resulted in fish consumption advisories being issued for both water bodies which resulted in listing Wham Brake and Bayou Lafourche on the State's 303(d) list.

Fish tissue samples have been collected and analyzed annually since 1988 for dioxin concentrations on a voluntary basis and then as part of International Paper's permit requirements. Effluent monitoring, is also a requirement in the permit, however, an IP representative reported that dioxin TEQ levels have not exceeded 10 PPQ since 1994 (Banker, *personal communication* 2001; See Appendix C). Fish data for this analysis were obtained from EPA Region 6 and International Paper and evaluated to determine whether the fish consumption advisories for subsegments 080900 and 080904 are still warranted. All of the fish collection and tissue analysis conducted by International Paper followed EPA prescribed quality assurance methods. Dioxin test results were obtained using EPA 1613 test procedure or the equivalent NCASI procedure. The tests were run using appropriate blanks, replicates and spikes according to the established QA/QC procedures for the test method. The fish data were composite samples of 3 to 10 fish (mostly 5 or 6 fish per sample with some exceptions) with a target collection of as similar a size as practical (within +/- 15 % length of each fish in a target species). Lab analysis of fish was conducted by Triangle Lab through 1998, and after that ALTA Lab provided analysis. The fish samples were tested on a wet weight basis (as is).

Yearly fish samples have been collected from two separate locations one at Wham Brake and another at Bayou Lafourche (Table 5; See Appendix C). At both Wham Brake (Figure 7) and Bayou Lafourche (Figure 8) past dioxin levels (prior to 1994) greatly surpassed LDHH screening levels. Following 1994 a precipitous decline in average dioxin occurred followed by an increase in recent years. The most recent data show for both sampling locations indicate fish tissue concentrations of dioxin were near or exceeding the screening level of 1.56 pg/g (Figure 9).

Table 5 Annual Average Dioxin Level of all Fish Species

Wham Brake					Bayou Lafourche				
Year	Average Dioxin TEC (pg/g)	Total Number of Samples	Number of Sample Dates	Number of Species	Year	Average Dioxin TEC (pg/g)	Total Number of Samples	Number of Sample Dates	Number of Species
1987	21.24	1	1	1	1987	5.22	2	1	2
1989	44.93	2	2	2	1989	5.57	4	1	4
1990	27.38	4	1	4	1990	9.36	8	2	5
1991	29.14	5	1	5	1991	4.44	5	1	5
1992	15.91	4	1	4	1992	4.22	5	1	5
1993	9.32	2	1	2	1993	2.64	5	1	4
1994	5.52	2	1	2	1994	2.67	4	1	4
1995	3.90	1	1	1	1995	1.00	4	1	2
1996	8.25	2	1	2	1996	0.45	2	1	2
1997	2.30	2	1	2	1997	0.90	2	1	2
1998	3.73	4	1	4	1998	1.60	2	1	2
1999	2.45	2	1	2	1999	0.60	2	2	2
2000	9.45	2	1	2	2001	3.10	1	1	1
2001	2.60	2	1	2					

Figure 7

Figure 8

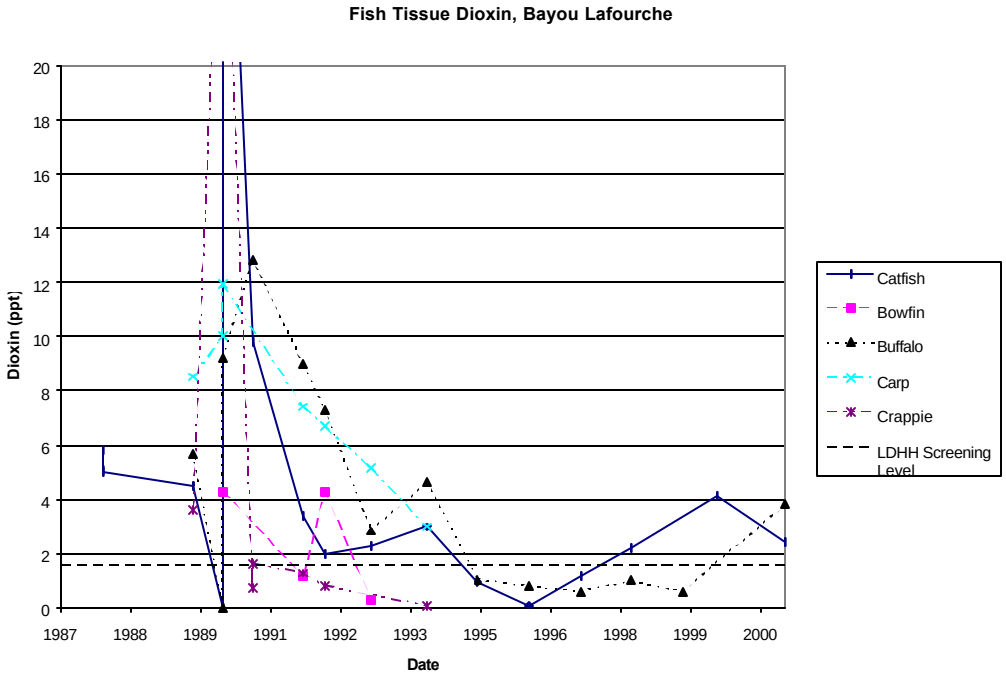
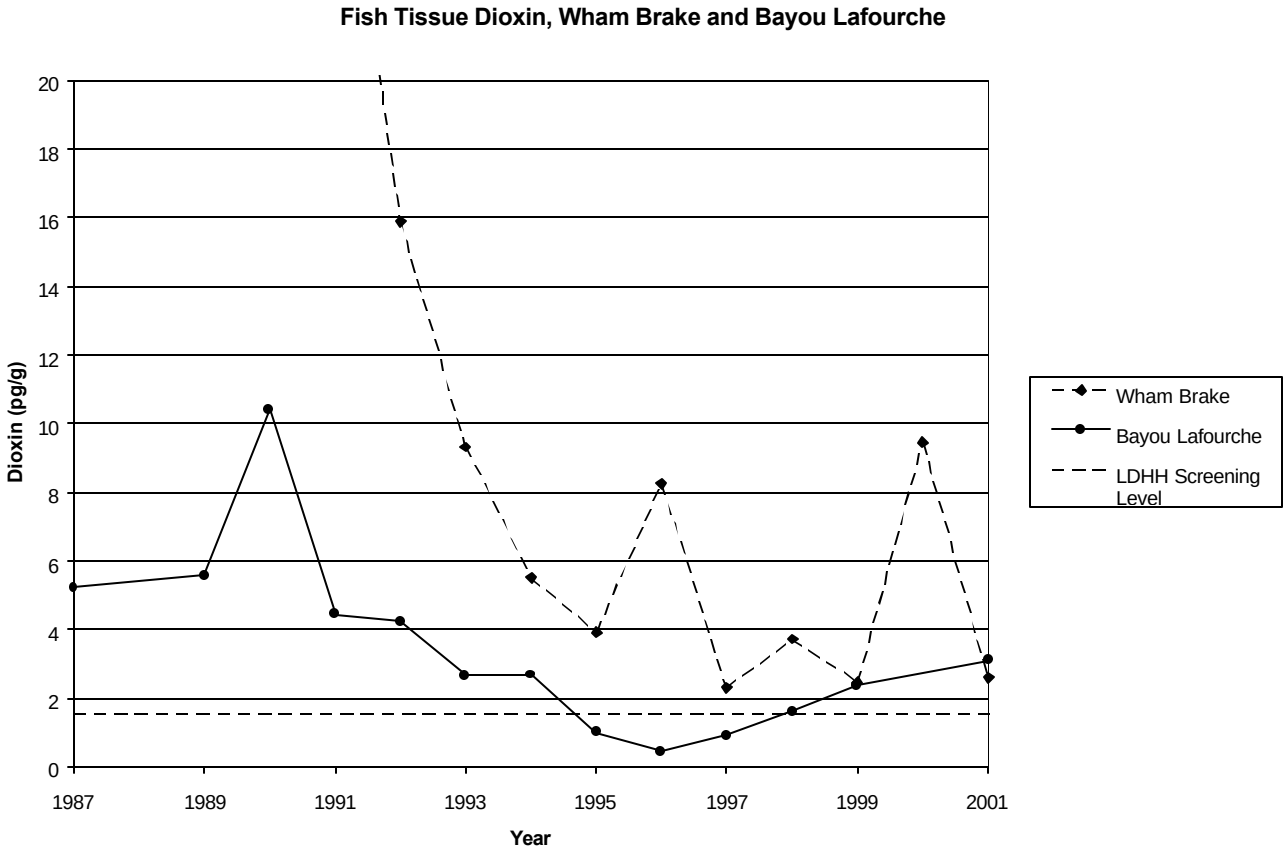


Figure 9


Fish Tissue Dioxin, Wham Brake and Bayou Lafourche
Dioxin (pg/g)
0
2
4
6
8
10
12
14
16
18
20
1987
1989
1991
1993
1995
1997
1999
2001
Year
Wham Brake
Bayou Lafourche
LDHH Screening Level

Summary/Conclusions

Despite internal process changes by International Paper at the Bastrop, LA pulp and paper mill plant, low levels of dioxin in wastewater effluent, and initial declines in fish tissue levels of dioxin, the current results preclude removal of the existing fish consumption advisories for Wham Brake and Bayou Lafourche (subsegments 080900 and 080904). In the absence of a comprehensive investigation into the causes of the recent increase in dioxin fish tissue concentrations, it is recommended that a TMDL be developed for Wham Brake and Bayou Lafourche.

Summary of Recommended Actions

Based on the re-evaluation of existing data and information the following actions are recommended for each water body.

Table 6 Recommended Actions

Water Body Name	Subsegment Number	Reason for Listing	Recommended Action
Dugdemona River	Subsegment 081401	Dioxin Concern	Do not prepare a TMDL for dioxin at this time. Conduct additional fish collection and analysis upstream and downstream of Hodge, LA to determine if dioxin concentration levels in fish tissue are still of concern.
Ouachita River	Subsegment 080101	Dioxin Concern	Do not prepare a TMDL. EPA and LDEQ initiate the formal procedure to remove dioxin as a pollutant of concern in the Ouachita River from the state's 303(d) List.
Tisdale Brake/Staulkinghead Creek to Little Bayou Boeuf	Subsegment 080912	Dioxin Concern	Address hydrologic link between Staulkinghead Creek and Whan Brake in the Wham Brake TMDL report. Determine if additional fish collection upstream of IP outfall #001 is feasible to verify if dioxin levels in fish are no longer of concern.
Wham Break Bayou Lafourche	Subsegment 080900 Subsegment 080904	Fish Consumption Advisory – Dioxin in Fish Tissue	Develop a dioxin TMDL for both Wham Brake and Bayou Lafourche that includes Little Bayou Boeuf for approval by EPA. Continue annual fish collection and analysis.

SECTION 4
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APPENDIX A
DUGDEMONA RIVER (SUBSEGMENT 081401)

Mel,

Please find below the response to your questions regarding the discharge from this facility. Please advise if additional information is needed.

Olevia McDonald

-----Original Message-----

From: Mel Vargas [SMTP:Mel.Vargas@parsons.com]

Sent: Tuesday, November 20, 2001 3:44 PM

To: omcdonald@smurfit.com

Cc: Randy M Palachek; Karim Al-Khafaji

Subject: Dioxin Assessment for Dugdemona River

Hi Olivia:

As we discussed over the phone, Parsons Engineering Science, Inc. is finalizing a report to U.S. EPA Region 6 and LDEQ that evaluates existing data to determine whether or not a TMDL is warranted for dioxin for the Dugdemona River. A few questions that we hope you could assist us on would help finalize our findings for Dugdemona R. in relation to the historical operations of the Smurfit-Stone Container Corp.

1. Could you provide us with the latitude and longitude of your outfall(s) and the address of the plant offices? A brief narrative description of where the outfall(s) are as described in your NPDES permit would also be helpful.

Outfall 001 Lat 32º 15' 45.1"
Long 92º 44' 33.8"

Outfall 002 Lat 32º 15' 47.8"
Long 92º 44' 57.9"

Address: Stone Container Hodge, Inc.
Mill Street
Hodge, LA 71247

The discharge from this existing facility is made into Dugdemona River in Segment No. 081401 of the Ouachita River Basin, a water of the United States classified for primary contact recreation, secondary contact recreation, and fish and wildlife propagation. The discharge is located on that water on Mill Street in Hodge, Louisiana.

2. Has the Smurfit-Stone Container Corp. ever monitored its effluent for dioxin?

No. The mill has never monitored its effluent for dioxin.

3. Has the Smurfit-Stone Corp. ever utilized dioxin in its process?

Based on my discussions with LDEQ it is my understanding that your plant is
a brown krafting plant which has no connection to dioxin byproducts.
The mill has never utilized dioxin in its process to the
best of my knowledge.
This facility manufactures unbleached Kraft pulp,
semi-chemical pulp, paper and paperboard.

Thank you for your help on this.
Mel Vargas
Project Manager
Parsons Engineering Science, Inc.

APPENDIX B
OUACHITA RIVER (SUBSEGMENT 08101)

Fish Tissue Data Ouachita Basin

DATE	PAPER_MILL	LOCATION	RIV	SPC	SAM	MIN_LGT	MAX_LGT	AVG_LGT	MIN_WGT	MAX_WGT	AVG_WGT	TCDD	TCDF	TEC	
Above Outfall															
Aug-90	GEORGIA PACIFIC	FELSENTHAL RESERVOIR	OR	BLC	C-6	15.5	22.5		1.5	4.89		1.29	ND	1.29	
Nov-90	GEORGIA PACIFIC	FELSENTHAL RESERVOIR	OR	BLC	C-6							3.70	0.58	3.76	2.52 1990 Avera
Sep-92	GEORGIA PACIFIC	BELOW SALINE RIVER	OR	FHC	C-3	21.5	23	0	3.25	4.25	0	<1.00	ND	0.00	
Sep-92	GEORGIA PACIFIC	BELOW SALINE RIVER	OR	FHC	I	30	0	0	11.5	0	0	1.80	<1.00	1.80	
Sep-92	GEORGIA PACIFIC	BELOW SALINE RIVER	OR	SLB	I	27.25	0	0	13.5	0	0	1.80	2.90	2.09	1.30 1992 Avera
Jul-93	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	I	27.5			9.5			<1.0	<1.0	0.00	
Jul-93	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	C-3	21	25	22.83	3	6	6.5	<1.0	<1.0	0.00	0.00 1993 Avera
Oct-94	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	C-2	20.5	23	21.75	3	4.5	3.75	<1.0	ND	0.00	
Oct-94	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	I	33.5			14			<1.0	ND	0.00	
Oct-94	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	I	23.5			3.75			<1.0	ND	0.00	
Oct-94	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	I	27.5			7			ND	ND	0.00	0.00 1994 Avera
Sep-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	I		29.5			8.5		<1.00	ND	0.00	
Sep-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	I		30.2			9.7		<1.00	<1.00	0.00	
Sep-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	I		26.5			5.8		ND	<1.00	0.00	
Sep-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	23.7	24.7	24.2	4.6	6	5.3	ND	ND	0.00	
Oct-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BLC	I		23.5			4		ND	ND	0.00	
Oct-96	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BUF	I		23.5			6.9		<1.00	1.30	0.13	0.02 1996 Avera
Nov-97	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	BLC	IND	22.5			3.3			<1.00	ND	0.00	
Nov-97	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	BLC	C-2	24.5	25.5	25	4.4	4.7	4.55	<1.00	ND	0.00	
Nov-97	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	IND	23.75			5.7			1.00	ND	1.00	
Nov-97	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	C-3	22	23.75	23.08	3.5	4.4	4.03	<1.00	<1.00	0.00	
Nov-97	GEORGIA PACIFIC	ABOVE HWY 82 BRIDGE	OR	FHC	IND	24.25			4.6			<1.00	ND	0.00	0.20 1997 Avera
Nov-98	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BCF	C-3	21	25	23.33	3.4	5	4.47	ND	ND	0.00	
Nov-98	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BCF	IND	28.5			7.9			ND	ND	0.00	
Nov-98	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	23	23.5	23.25	4.1	4.2	4.15	ND	ND	0.00	

Fish Tissue Data Ouachita Basin

DATE	PAPER_MILL	LOCATION	RIV	SPC	SAM	MIN_LGT	MAX_LGT	AVG_LGT	MIN_WGT	MAX_WGT	AVG_WGT	TCDD	TCDF	TEC	
Nov-98	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	IND	27			6.3			<1.00	ND	0.00	0.00 1998 Avera
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BCF	I			21			3.6	ND	<1.00	0.00	
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BUF	I			23.5			8.1	ND	1.00	0.10	
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BUF	C-2	21.5	21.5	21.5	5.7	6.1	5.9	<1.00	1.2	0.12	
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	23	29.5	26.25	3.6	9.5	6.55	<1.00	<1.00	0.00	
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	20.5	26.25	23.38	2.7	6.1	4.4	ND	ND	0.00	
Oct-99	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	I			30.5			9.8	ND	ND	0.00	0.04 1999 Avera
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	BLC	C-2	21	26.5	23.75	3	6.2	4.6	ND	ND	0.00	
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	22	23.5	22.75	3.5	4.2	3.85	<1.00	ND	0.00	
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	I	25			4.7			ND	ND	0.00	
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	FHC	C-2	21.75	23.75	22.75	3.4	4.5	3.65	<1.00	1.2	0.12	
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	SMB	I	20.5			5			<1.00	<1.00	0.00	
Nov-00	GEORGIA PACIFIC	ABOVE FELSENTHAL	OR	SMB	C-2	16	17.52	16.76	2.2	4	3.1	<1.00	ND	0.00	0.02 2000 Avera
						Below Outfall									
Aug-90	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-7	22	28	0	3.59	12.67	0	36.11	5.84	36.69	
Aug-90	GEORGIA PACIFIC	BELOW FELSENTHAL DAM	OR	BLC	C-4	20	21	0	2.59	3.99	0	5.47	N/A	5.47	
Nov-90	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-7							27.00	8.00	27.80	
Nov-90	GEORGIA PACIFIC	BELOW FELSENTHAL DAM	OR	BLC	C-4							6.40	ND	6.40	19.09 1990 Avera
Mar-91	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	0	0	0	5	5.5	5.25	20.10		20.10	
Sep-91	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-3	20.5	24.5	23	3.25	5.5	4.67	8.40	4.00	8.80	
Sep-91	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-4	0	0	0	3.5	5	0	4.50	2.10	4.71	
Sep-91	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-3	22.3	23.5	22.77	3.75	4.25	3.92	2.60	1.40	2.74	
Sep-91	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	26	26	26	7	7	7	5.70	2.10	5.91	8.45 1991 Avera
Sep-92	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	27.5	28.5	28	8.25	9	8.63	2.30	<1.00	2.30	
Sep-92	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	23.25	25	24.13	4.5	5.25	4.88	5.70	2.10	5.91	

Fish Tissue Data Ouachita Basin

DATE	PAPER_MILL	LOCATION	RIV	SPC	SAM	MIN_LGT	MAX_LGT	AVG_LGT	MIN_WGT	MAX_WGT	AVG_WGT	TCDD	TCDF	TEC	
Sep-92	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	LGB	I	23	0	0	8	0	0	13.00	44.20	17.42	8.54 1992 Avera
Jul-93	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BUF	I	26.75			11.25			9.3	38.7	13.17	
Jul-93	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	SLB	C-4	19.75	23.25	22	5.25	7.25	6.31	2.5	16.0	4.10	
Aug-93	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	12	15.5	13.75	0.5	1	0.75	1.1	ND	1.10	
Nov-93	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	17.5	20.5	19	2	2.75	2.38	4.2	1.5	4.35	
Nov-93	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	23.5	25.25	24.38	4.75	5.25	5	4.1	<1.0	4.10	5.36 1993 Avera
Oct-94	GEORGIA PACIFIC PCE	BELOW COFFEE CREEK	OR	BLC	I	29.49			11			7.8	1.5	7.95	
Oct-94	GEORGIA PACIFIC PCE	BELOW COFFEE CREEK	OR	BLC	I	23.74			5			4.7	ND	4.70	
Oct-94	GEORGIA PACIFIC PCE	BELOW COFFEE CREEK	OR	BLC	I	25.24			6.5			2.1	<1.0	2.10	
Oct-94	GEORGIA PACIFIC PCE	BELOW COFFEE CREEK	OR	BLC	I	25			6.5			2.7	ND	2.70	
Oct-94	GEORGIA PACIFIC PCE	BELOW COFFEE CREEK	OR	BLC	I	24.76			5.5			ND	ND	0.00	
Oct-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I	29.5			10.25			17.8	ND	17.80	
Oct-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-3	24	26	24.83	4.75	6.5	5.5	3.8	<1.0	3.80	
Oct-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I	21			2			2.7	ND	2.70	
Oct-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	SLB	I	21.75			6			<1.0	1.3	0.13	
Oct-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	SLB	I	22			6			3.0	12.1	4.21	
Nov-94	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLF	C-5	23.75	29.5	25.65	5	11	6.9				4.61 1994 Avera
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	I		21	0		2.5		1.50	ND	1.50	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	19.2	24	21.6	2.1	4.3	3.2	3.10	<1.00	3.10	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	I		22.5			3.7		<1.00	<1.00	0.00	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BUF	I		17.5			3.1		ND	ND	0.00	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I		29.5			8.1		1.10	ND	1.10	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I		25.5			5.7		ND	ND	0.00	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	22	23	22.5	3.2	4.5	3.57	1.60	ND	1.60	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I		27.2			6.5		1.10	<1.00	1.10	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	LBF	C-2	21	22	21.5	6.1	6.2	6.15	<1.00	3.90	0.39	

Fish Tissue Data Ouachita Basin

DATE	PAPER_MILL	LOCATION	RIV	SPC	SAM	MIN_LGT	MAX_LGT	AVG_LGT	MIN_WGT	MAX_WGT	AVG_WGT	TCDD	TCDF	TEC	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	LBF	I		23.5			8.3		<1.00	4.30	0.43	
Oct-96	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	LMB	I		18.5			4		<1.00	2.80	0.28	0.86 1996 Avera
Nov-97	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	IND	25			5.5			1.10	<1.00	1.10	
Nov-97	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	20.5	25.5	23	2.8	5.4	4.1	<1.00	<1.00	0.00	
Nov-97	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	24	24	24	4.6	4.8	4.7	ND	<1.00	0.00	
Nov-97	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-3	21.25	24	22.42	3.4	4.3	3.87	1.10	<1.00	1.10	0.55 1997 Avera
Nov-98	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BCF	IND	22			3.7			ND	<1.00	0.00	
Nov-98	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BCF	C-2	21	22	21.5	2.9	3	2.95	ND	ND	0.00	
Nov-98	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	20.5	21.5	21	3	3.4	3.2	<1.00	<1.00	0.00	
Nov-98	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	IND	23			4			ND	ND	0.00	0.00 1998 Avera
Oct-99	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BUF	C-2	21.5	23	22.25	5.5	7.1	6.15	<1.00	2.8	0.28	
Oct-99	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BUF	C-3	18.5	20.25	19.5	4	4.7	4.3	<1.00	2.7	0.27	
Oct-99	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I			24			4.5	<1.00	ND	0.00	
Oct-99	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I			28			7.8	<1.00	<1.00	0.00	
Oct-99	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I			20.25			2.8	1.20	ND	1.20	0.35 1999 Avera
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	BLC	C-2	20.5	24.5	22.5	3	5.7	4.35	2.1	ND	2.10	
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	22.75	23.5	23.13	4	4.1	4.05	ND	ND	0.00	
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	I	24.25			5.1			<1.00	ND	0.00	
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	FHC	C-2	22.75	24.75	23.75	3.5	4.3	3.9	<1.00	ND	0.00	
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	SMB	C-2	18	18.25	18.13	3.2	4	3.6	ND	2.1	0.21	
Nov-00	GEORGIA PACIFIC	BELOW COFFEE CREEK	OR	SMB	C-2	17	17.5	17.25	2.8	3.3	3.05	<1.00	1.5	0.15	0.41 2000 Avera

APPENDIX C
WHAM BRAKE/BAYOU LAFOURCHE (SUBSEGMENTS 08900 & 08904)

Tulane University Health Sciences Center

SCHOOL OF PUBLIC HEALTH AND TROPICAL MEDICINE
Department of Environmental Health Sciences SL29
1430 Tulane Avenue
New Orleans, Louisiana 70112-2699
(504) 588-5374 Fax: (504) 584-1726

Environmental Diseases Prevention Research Center

Date: November 28, 2001

From: Dr. William Hartley, Associate Professor and Co-Director

Re: Risk Assessment for 2,3,7,8-TCDD and 2,3,7,8-TCDF levels in Fish from Wham Brake, Bayou Lafourche, and Lake Irwin

Objective:

In November, DEQ received a set of recent fish tissue data generated by a consulting firm employed by International Paper to sample for 2,3,7,8-TCDD/TCDF annually. Last week DEQ forwarded the data to DHH and requested a risk assessment of the data and a review of the fish advisories on Wham Brake and Bayou Lafourche to determine if lifting the existing advisories would be an appropriate measure. Ms. Stephanie Martin, Tulane SPH&TM and Ms. Shannon Soileau, LDHH/OPH/SEET conducted the risk assessment and I subsequently reviewed their data analysis.

Discussion:

Note: The fish tissue samples were screened for only two of the many existing congeners of TCDD and TCDF. Therefore, the sampled contaminant levels may underestimate the actual contaminant level, resulting in higher risk levels.

Wham Brake

There is an observable downward trend in the TCDD/TCDF levels between 1987 and 2001, however concentrations are not low enough to justify lifting the advisory. There are also a limited number of data sets after 1995. I recommend leaving the advisory in place. I also recommend continued annual sampling of the target species and periodic reevaluation of the data.

Bayou Lafourche

There also appears to be a slight downward trend in the TCDD/TCDF levels between 1987 and 2001. However, there is not sufficient data to justify lifting the advisory. Between 1997 and 2000 only two different species were sampled. I

recommend leaving the advisory in place and continued annual sampling of the target species and periodic reevaluation of the data.

Lake Irwin

Although the advisory was lifted in 1996, there's limited new data. Only 5 samples of 2 different species had been taken since 1996. All TCDD/TCDF levels were low except a 1999 Buffalo sample (5.3-ppt TEQ). I recommend continued annual sampling of the target species and periodic reevaluation of the data.

History:

Wham Brake
(Winn)
Dioxin Advisory: NO fish consumption. 7.2 sq. miles
Issued 11/87; Reviewed 3/94 and 11/96

Bayou Lafourche: from Hwy. 80 overpass to I-20
(Ouachita)
Dioxin Advisory: Eat no crappie. Limit consumption to TWO MEALS PER MONTH for all other species. 2 miles
Issued 3/1994; Revised 11/96: Limit consumption to TWO MEALS PER MONTH for all species.

Lake Irwin
(Morehouse)
Dioxin Advisory: Limit consumption to TWO MEALS PER MONTH for small mouth buffalo.
Issued 3/1994; Lifted 11/1996

Sampling and Data Analyses:

Consultants and analytical laboratories hired by International Paper carried out the sampling and data analysis. It is assumed that the parameters set forth by the Fish Sampling and Analytical Program for Lake Irwin, Wham Brake, and Bayou Lafourche (Agreed upon by LDEQ, LDHH and IP; dated September 1991) were followed. The program states that 5-6 adult fish of the same species and similar size will be collected and combined to form a composite sample. At each annual sampling event a composite sample will be obtained for the following target species: buffalo, blue catfish, largemouth bass, flathead catfish, crappie, carp, channel catfish, and bowfin. Samples will be taken from Wham Brake, at the Railroad Bridge adjacent to the Highway 134 overpass. Samples will be taken from Lake Irwin beginning 1 mile above the Morehouse Parish Road overpass and ending downstream at the weir. Samples will be taken from Bayou Lafourche between Highway 80 and Interstate 20.

Risk Assessment Approach:

A risk assessment was completed following guidelines set forth in the document entitled Protocol for Issuing Health Advisories and Bans Based on Chemical Contamination of Fish/Shellfish in Louisiana (LDHH; January 1997).

Toxicity equivalence (TEQ) for dioxin was calculated using toxic equivalency factors (TEFs) for 2,3,7,8-TCDD and 2,3,7,8-TCDF (WHO). An exposure dose was calculated using the total TEQ for dioxin, an average consumption rate of 30 g of fish per day, and an average body weight of 70 kg (10 kg for a child scenario). In order to assess systemic health risks resulting from exposure to TCDD/TCDF, a margin of exposure (MOE) was calculated using a Minimal Risk Level (MRL) of 1 pg/kg/d (ATSDR). The cancer risk, an upper bound estimate of carcinogenic risk, was also calculated using a Cancer Slope Factor (CSF) of 1.5×10^{5} $(mg/kg/d)^{-1}$ (HEAST).

Dioxin Data Collected By IP-Bastrop

Dioxin test results were obtained using EPA 1613 test procedure or the equivalent NCASI procedure. The tests were run using appropriate blanks, replicates and spikes according to the established QA/QC procedures for the test method. The fish data were composite samples of 3 to 10 fish (mostly 5 or 6 fish per sample with some exceptions) with a target collection of as similar a size as practical (within +/- 15 % length of each fish in a target species). Triangle Lab made tests through 1998, and after that ALTA Lab made tests. The % lipid, weights, and lengths of the fish samples are being compiled from the raw data files and will be sent as soon as completed. The fish samples were tested on a wet weight basis (as is).

Dioxin precursors were eliminated in 1998/9 from defoamers used at the Louisiana Mill. In 1992, the Chlorine Dioxide substitution in the bleach plant was increased from 5 % to 50 % Chlorine Dioxide by maximizing ClO2 production. In 1994, the substitution was increased to 100 % when the bleach plant was converted to elemental chlorine free (ECF). Installing a larger ClO2 Generator and eliminating the use of elemental chlorine achieved this.

The effluent from the Louisiana Mill was tested as part of the 104 Mill Cooperative Study between Industry and the EPA in 1988. The study was coordinated by NCASI. The effluent dioxin concentration from that study for the Louisiana Mill was:

2378 TCDD = 330 PPQ
2378 TCDF = 1600 PPQ
TEQ = 2378 TCDD + (0.1) 2378 TCDF
TEQ = 490 PPQ

This was one of the highest effluent results in the United States. Since 1994, the dioxin concentration in the effluent has been non-detect at 10 PPQ or less than 10 PPQ.

Dioxin in the Louisiana Mill primary clarifier sludge in the 104-mill study from 1988 was:

2378 TCDD = 140 PPT
2378 TCDF = 677 PPT
TEQ = 207.7 PPT

Dioxin in the Louisiana Mill primary clarifier sludge in 1999 was:

2378 TCDD = 0.22 PPT
Total TCDD = 2.1 PPT
2378 TCDF = 0.33 PPT
Total TCDF = 1.7 PPT
TEQ = 0.34 PPT

If there are any more questions, please contact me at 318-556-1466 or e-mail kernan.banker@ipaper.com.

Kernan Banker
11/16/01

BAYOU LAFOURCHE FISH TISSUE ANALYSES
DIOXIN - EDIBLE PORTION, 1987 THROUGH 2001

Fish Analyzed	Date Sampled	2,3,7,8 - TCDD (ppt)	2,3,7,8 - TCDF (ppt)	Total TEQ (ppt)	Average TEQ/yr (ppt)
Blue Catfish	Dec-87	5.5	2.9	5.8	
Blue Catfish	Dec-87	4.8	2.7	5.1	
Blue Catfish	Dec-87	5.0	--	5.0	
Blue Catfish	Sep-89	4.3	1.6	4.5	**1987 = 5.2**
Blue Catfish	Apr-90	ND	ND	ND	
Blue Catfish	Apr-90	25.8	84.2	34.2	
Blue Catfish	Nov-90	9.6	1.8	9.8	
Blue Catfish	Nov-91	3.1	2.6	3.4	**1989 = 5.6**
Blue Catfish	Apr-92	1.9	0.7	2.0	
Blue Catfish	Apr-94	2.9	0.8	3.0	
Blue Catfish	Apr-95	0.9	0.5	1.0	
Blue Catfish	Apr-96	ND	0.82	0.1	
Blue Catfish	Apr-97	1.1	0.8	1.2	
Blue Catfish	Apr-98	2	2.1	2.2	
Blue Catfish	Dec-99	3.8	3.0	4.1	
Blue Catfish	Apr-01	2	4.4	2.4	
Bowfin	Apr-90	3.4	8.7	4.3	
Bowfin	Nov-91	0.8	3.9	1.2	
Bowfin	Apr-92	3.0	12.9	4.3	
Bowfin	Mar-93	0.2	1.1	0.3	**1990 = 10.4**
Buffalo	Apr-90	ND	ND	ND	
Buffalo	Apr-90	7.4	17.9	9.2	
Buffalo	Nov-90	10.7	21.2	12.8	

Buffalo	**Apr-94**	2.7	19.5	4.7	
Buffalo	**Apr-95**	1.0	0.5	1.1	**1991 = 4.5**
Buffalo	**Apr-96**	ND	7.7	0.8	
Buffalo	**Apr-97**	0.4	1.8	0.6	
Buffalo	**Apr-98**	0.7	2.8	1.0	
Buffalo	**Apr-99**	0.4	1.6	0.6	
Buffalo	**Apr-01**	1.58	22.5	3.8	**1992 = 4.2**
Bule Catfish	**Mar-93**	2.3	ND	ND	
Carp	**Sep-89**	7.0	15.1	8.5	
Carp	**Apr-90**	9.1	8.9	10.0	
Carp	**Apr-90**	9.9	20.1	11.9	**1993 = 2.6**
Carp	**Nov-91**	5.9	15.0	7.4	
Carp	**Apr-92**	5.8	9.1	6.7	
Carp	**Mar-93**	4.9	2.3	5.1	
Carp	**Apr-94**	2.6	3.8	3.0	**1994 = 2.7**
Catfish	**Dec-87**	5.0	--	5.0	
Crappie	**Apr-90**	23.1	71.7	30.3	**1995 = 1.1**
Crappie	**Nov-90**	0.7	0.2	0.7	
Crappie	**Nov-90**	1.3	3.4	1.6	**1996 = 0.5**
No Sample-	**Jun-05**	Drought - ow Water			
S. Mouth Buffalo	**Sep-89**	4.0	16.8	5.7	**1997 = 0.9**
S. Mouth Buffalo	**Nov-91**	6.2	27.8	9.0	
S. Mouth Buffalo	**Apr-92**	5.5	18.1	7.3	**1998 = 1.6**
S. Mouth Buffalo	**Mar-93**	2.1	7.3	2.8	
White Crappie	**Sep-89**	2.7	9.2	3.6	**1999 = 2.4**
White Crappie	**Apr-92**	0.7	1.2	0.8	
White Crappie	**Apr-94**	ND	0.8	0.1	
Whith Crappie	**Nov-91**	0.9	3.8	1.3	**2001 = 3.1**

WHAM BRAKE FISH TISSUE ANALYSES
DIOXIN - EDIBLE PORTION, 1987 THROUGH 2001

Fish Analyzed	Date Sampled	2,3,7,8 - TCDD (ppt)	2,3,7,8 - TCDF (ppt)	Total TEQ (ppt)	Average TEQ/yr (ppt)	Comments
B. Mouth Buffalo	Nov-91	31.4	148.0	46.2	**1987 = 21.2**	Avg. of 2 Tests
B. Mouth Buffalo	Apr-92	27.8	57.8	33.6		Avg. of 2 Tests
Bass	Apr-98	3.2	4.8	3.7	**1989 = 45.0**	
Bass	Apr-99	2.2	2.2	2.4		
Bass	Apr-01	1.5	6.2	2.1		
Black Crappie	Nov-91	13.1	41.4	17.2		
Bowfin	Sep-89	32.3	88.9	41.2	**1990 = 27.4**	
Bowfin	Apr-90	9.5	1.6	9.7		
Bowfin	Nov-91	14.8	57.0	20.5		
Bowfin	Apr-92	2.7	9.1	3.6		
Bowfin	Mar-93	11.3	40.4	15.3		
Bowfin	Apr-94	3.8	22.9	6.1	**1991 = 29.1**	
Bowfin	Apr-95	2.3	16.0	3.9		
Bowfin	Apr-96	2.4	13.7	3.8		
Bowfin	Apr-97	ND	4.1	0.4		
Bowfin	Apr-98	3.4	20.0	5.4	**1992 = 15.9**	
Bowfin	Jun-00	8.6	70.1	15.6		
Buffalo	Apr-90	31.7	91.5	40.9	**1993 = 9.3**	
Buffalo	Apr-94	3.4	15.5	5.0		
Carp	Nov-91	43.7	--	43.7	**1994 = 5.6**	
Carp	Mar-93	2.8	4.9	3.3	**1995 = 3.9**	
Carp	Apr-97	3.9	15.9	4.2		
Carp	Apr-98	2.0	3.8	2.4	**1996 = 8.3**	

Carp	Apr-90	32.3	16.6	34.0	
Carp	Apr-96	8.6	41.4	12.7	**1997 = 2.3**
Catfish	Feb-89	48.2	4.6	48.7	
Crappie	Feb-87	13.1	81.4	21.2	
Crappie	Apr-90	19.7	53.4	25.0	
Crappie	Apr-98	2.4	9.6	3.4	**1998 = 3.7**
Crappie	Apr-01	1.6	14.7	3.1	
White Crappie	Apr-92	9.1	23.1	11.4	**1999 = 2.5**
Y. Bullhead Catfish	Nov-91	17.2	8.6	18.1	
Y. Bullhead Catfish	Apr-92	14.5	5.2	15.0	**2000 = 9.5**
Y. Bullhead Catfish	Apr-99	2.3	2.3	2.5	
Y. Bullhead Catfish	Jun-00	2.8	4.8	3.3	**2001 = 2.6**

APPENDIX D
LIST OF CONTACTS

Contacts for Dioxin Data Assessment Report

December-01

Georgia Pacific Mill at Crossett, AR
Permit #AR0001210
Ouachita River (Subsegment 080101)

Name	Contact Info	Area of Responsibility
Tom Gathright	870-567-8670 Georgia Pacific Co Crossett, AR Fax: 870-364-9076	Senior Environmental Engineer
Jim Wise	501-682-0662 Arkansas DEQ Water Division FAX: 501-682-0910	Fish Data Reports for GA Pacific
Mark Bradley	501-682-0628 Arkansas DEQ Permits Division	Permitting Manager
David Ramsey	501-682-0615 Arkansas DEQ Permits Division	DMR Data
Mo Schaffee	501-682-0616 Arkansas DEQ Permits Division	Permit Writer for GA Pacific Mill at Crossett, AR
Emelise Cormier	225-765-0759 Louisiana DEQ Environmental Technology Div.	Dioxin Project Coordinator

International Paper Mill at Bastrop, LA
Permit #LA0007561
Staulkinghead Creek/Little Bayou Boeuf/ Wham Brake/Bayou Lafourche
(Subsegments 080912, 080904)

Name	Contact Info	Area of Responsibility
Kernan Banker	318-556-1466 International Paper Co. Bastrop, LA	Environmental Leader
Bob Jacobsen	225-231-5831 URS Baton Rouge, LA 70809	Fish Data from Papermill
Emelise Cormier	225-765-0759 Louisiana DEQ Environmental Technology Div.	Dioxin Project Coordinator

Smurfit-Stone Container Corp., Hodge, LA Permit #LA0007684 Dugdemona River (Subsegment 081401)		
Name	**Contact Info**	**Area of Responsibility**
Olevia McDonald	318-259-4421 Smurfit-Stone Corp. Hodge, LA omcdonald@smurfit.com	Environmental Supervisor
Emelise Cormier	225-765-0759 Louisiana DEQ Environmental Technology Div.	Dioxin Project Coordinator
Miscellaneous		
Robert Starszak	504-568-8028 LA Dept. of Health and Hospitals New Orleans, LA	Fish Consumption Advisories